



The UK MoD Human Factors Integration Programme

TTCP- HUM 9

Toronto 5 - 9 June 2000

The Team Today

Directorate of Naval Manning

DERA & Defence Procurement Agency
(DPA) Sea Technology Group

DERA Centre For Human Sciences

DERA & DPA Future Business Group

Introduction

- **UK Domains**
- **High level policy context - SDR/SPI**
- **HFI in Acquisition Management System**
- **Application at Project Level**
- **Lessons Learnt**
- **Naval Manpower Planners Perspective**

UK HFI Domains

- **Manpower** - The number of military and civilian personnel required and potentially available to operate, maintain, sustain, and provide training for systems.
- **Personnel** - The cognitive and physical capabilities required to be able to train for, operate, maintain and sustain systems.
- **Training** - The instruction or education, and on-the-job or unit training required to provide personnel their essential job skills, knowledge, values and attributes.

UK HFI Domains cont.

- **Human Factors Engineering** - The integration of human characteristics into system definition, design, development and evaluation to optimise human-machine performance under operational conditions.
- **Health Hazard Assessment** - Short or long term hazards to health occurring as a result of normal, operation of the system.
- **System safety** - Safety risks occurring when the system is functioning in an abnormal manner.
- **Survivability? - Under consideration**

Survivability ?

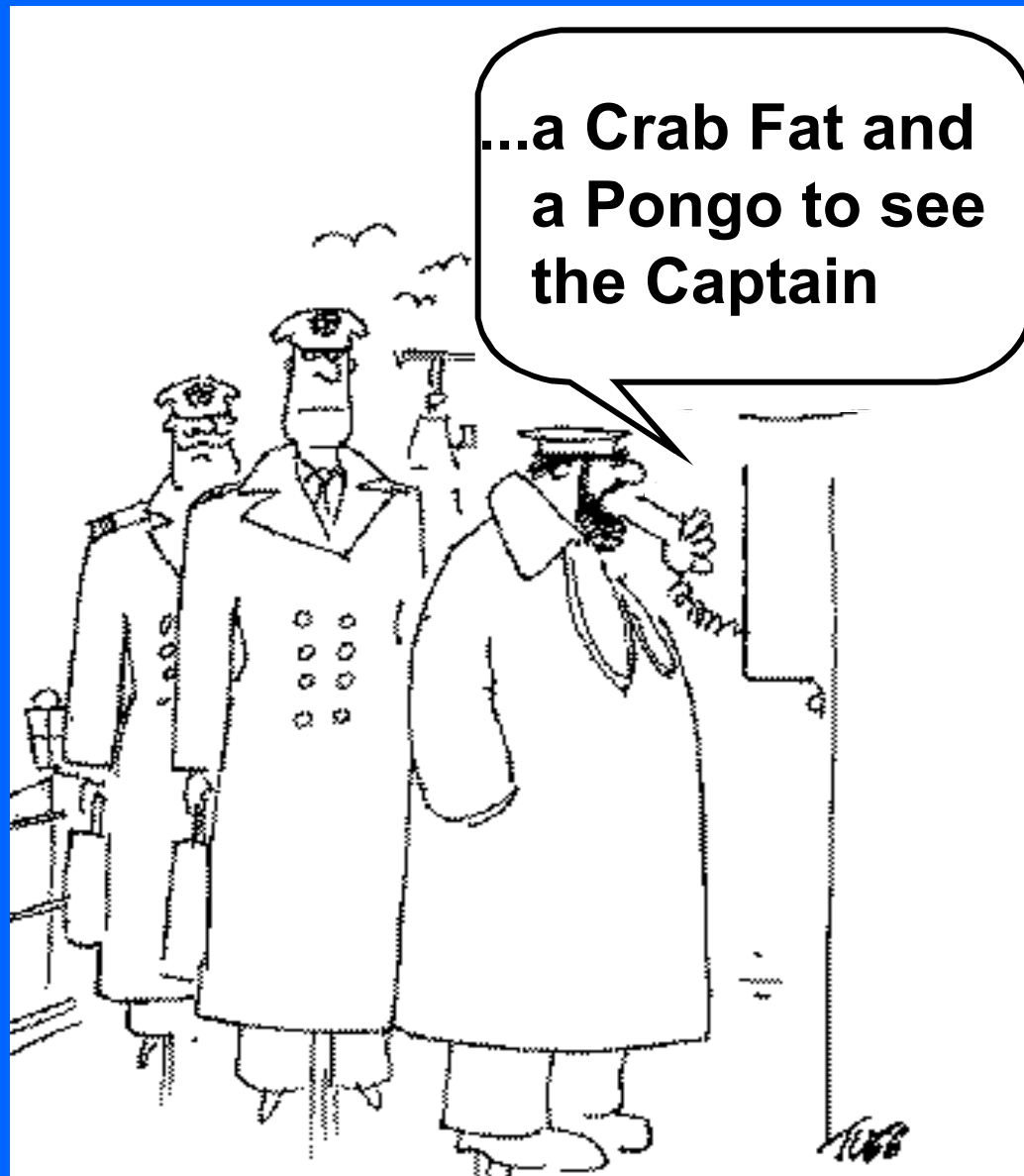
- **Sea Technology Group** argue that survivability is already addressed by Naval IPTs.
- **Army** see it as an 'integrating' domain.
- **System/Mission/Man - Naval NBCD and Safety at Sea?**
- **Key User Requirement or new Domain ?**

UK STRATEGIC DEFENCE REVIEW



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- **Capability Management**
- **Military capabilities - system of systems**
- **MCJO - Greater Tri Service co-operation**



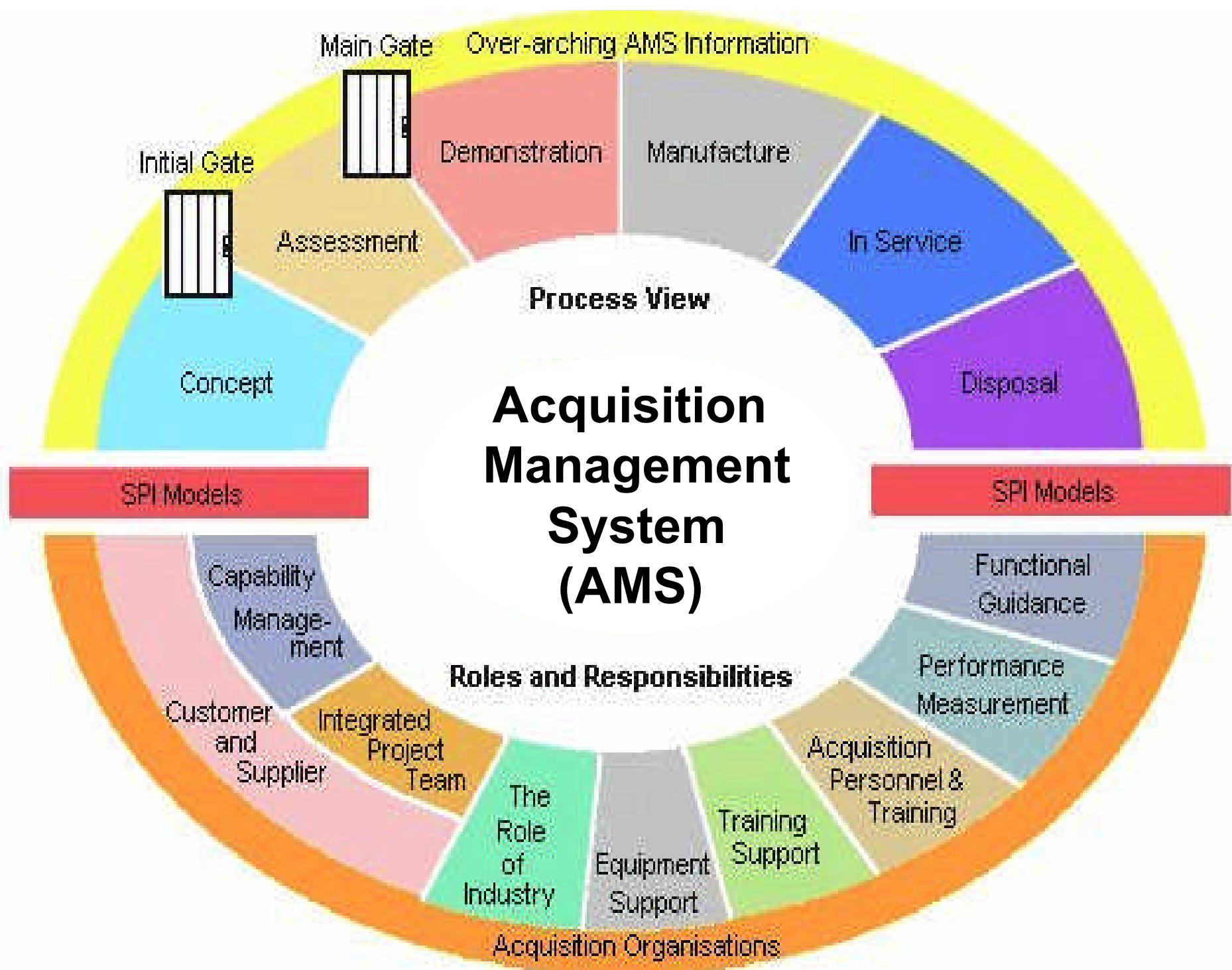
MCJO - Greater Tri Service Co-operation

UK STRATEGIC DEFENCE REVIEW

- **Capability Management**
- **Military capabilities - system of systems**
- **MCJO - Greater Tri Service Co-operation**
- **SMART Procurement - BETTER FASTER CHEAPER**
- **Partnership through IPTs**
- **Life Cycle Considerations**
- **Acquisition Management System**

Acquisition

**Acquisition is a whole life process,
covering requirements, setting initial
procurement, in-service support and
disposal**



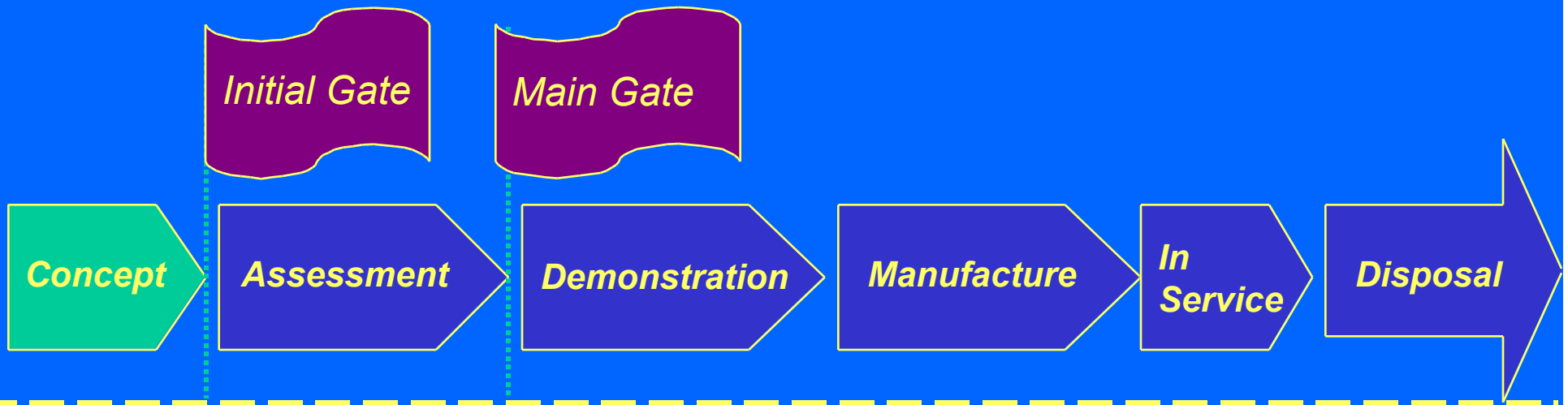
HFI in the Acquisition Cycle

- **Mechanisms in place to provide focus for HFI within acquisition.**
- **Supporting activities to develop guidance for HFI in capability management and the management of HFI throughout acquisition.**
- **Guidance on HFI web site within the MoD Acquisition Management System (AMS).**

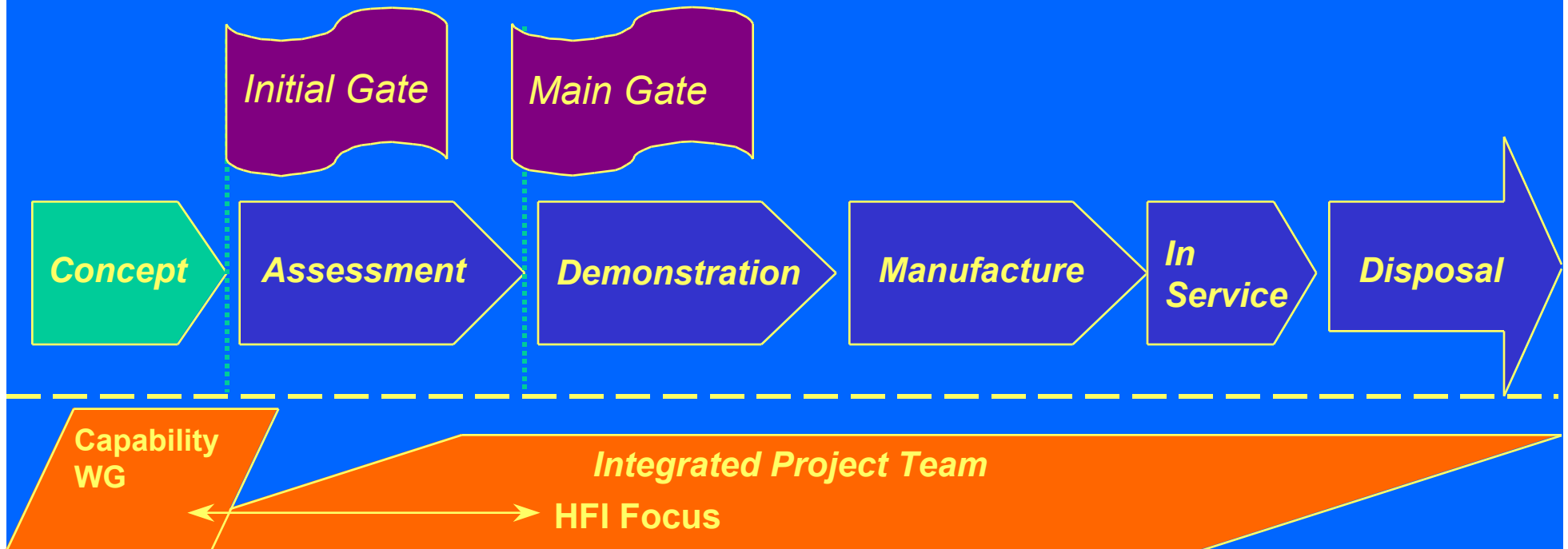
HFI Systematic Process (1)

- **Develop HFI Element Of The Procurement Strategy (PS)**
- **Establish HFI Focus As Part Of The IPT**

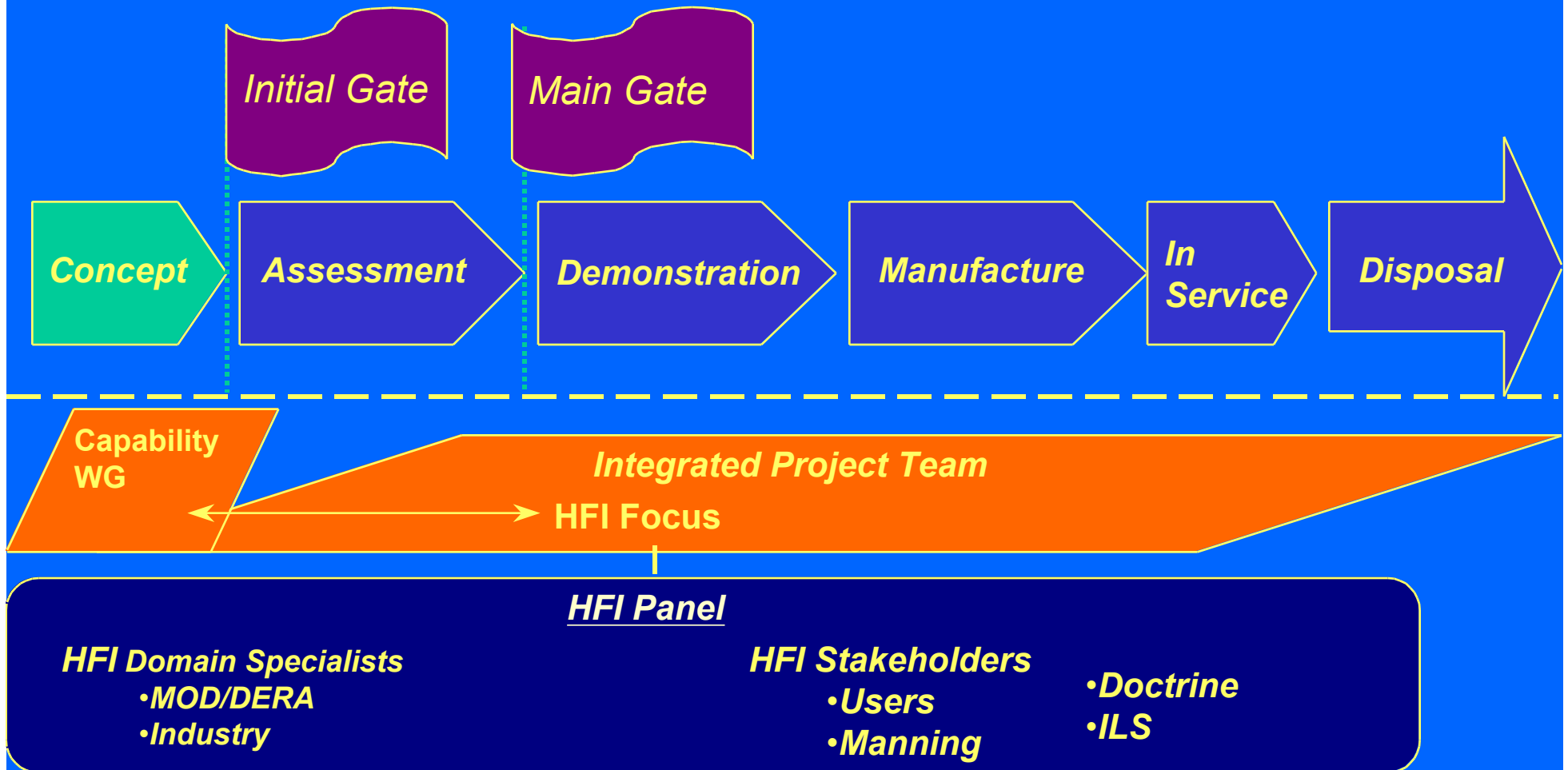
THE “SMART” PROCUREMENT PROCESS



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THE "SMART" PROCUREMENT PROCESS



HFI Systematic Process (1)

- **Develop HFI Element Of The Procurement Strategy (PS)**
- **Establish HFI Focus As Part Of The IPT**
- **Review Operational Scenario**
- **Update/Conduct EHFA.**
- **Seek Advice From HF Centres Of Excellence**
- **Formulate HFI Strategy**
- **Identify HFI Resources & Funds**
- **Produce HFI Plan**

Human Factors Integration Plan

- Audit trail for design decisions
- Addresses dependencies
- Defines inputs/outputs
- Sequence of HF activities
- Importance of HF activities
- Timing and scope deliverables
- Production and timing of HF Requirements

Human Factors Integration Plan (Continued)

- **HF Specifications**
- **Lists Assumptions (i.e. timely access to SMEs, timescales, priorities, access to data)**
- **HF objectives and tasks**
- **HF Team organisation**
- **Work breakdown and scheduling**
- **Configuration control**

HFI Systematic Process (2)

- Obtain Task Analysis Data
- Review and Verify Manpower and Personnel Requirements
- Develop Target Audience Description
- Develop Training Needs Analysis
- Identify Need For Performance Trials and User Access
- Identify Need For HF Style Guide
- Produce HFI Section For ITT
- Develop HFI Acceptance Criteria

Lessons Learnt so Far

- **Implicit assumption that projects would have 'in-house' HFI practitioner.**
 - But 800 projects and few specialists - barrier to comprehensive application of HFI.
- **HFI was viewed as being “owned” by HF community - difficulty in gaining acceptance by projects.**
- **Non-specialist staff may carry out some HFI activities.**

Addressing the Issues

- **IPT responsible for developing and managing project HFI strategies and plans - encouraged to seek specialist advice as they see necessary.**
- **HFI focus nominated within the core team:**
 - co-ordinate HFI activities across programme.
 - ensure key stakeholders, including end users and industry, involved throughout.
 - not normally an HF practitioner.
- **Key activities identified and techniques developed to support non-specialist staff.**

Supporting IPTs in HF application

- **DPA Future Business Group:**
 - HFI Policy & Guidance, LFE Seminar.
- **DPA Sea Technology Group (Human Factors in Ship Design)**
 - Guides and Liaison Group
 - Training
- **DERA:**
 - MOD Research Programmes and Project Support
- **Principal Personnel Officers**
- **MOD-Industry Liaison Group**
- **Access to end user**

HF Documents & Guidance

- **Previous Guidance**
 - Desk Officers Guide (and others)
 - Early Human Factors Analysis User Guide
 - CDPI & DPMG
- **HFI Workshops**
- **Current Guidance**
 - HFI and Capability Management
 - Introduction to HFI
 - Practical Guide to HFI
 - Introduction to Target Audience Description
 - Practical Guide to Target Audience Descriptions

Sea Technology Group

- **Naval Equipment Human Factors Guides:**
 - Available on CD-ROM
 - Intended for MOD and Industry.
- **Training for IPT personnel:**
 - HFI in project definition, design and development - link with SMART Procurement.
 - Understand importance of considering the capabilities and performance of the user under operational conditions.
 - Overview of HF methods, tools and techniques
 - Understand the role of HF in system engineering process.
 - Identify risks as early as possible.
- **TAD Guidance Development**
- **Sponsor CREW2**

Learning From Experience - Common Themes

- **Establish clear requirement & know precisely what your are trying to achieve.**
- **Do not underestimate Systems and Software integration task.**
- **Be wary of “COTS” in Military Scenarios.**
- **Equipment v Operational/capability focus.**
- **Value of mock ups/test rigs**
- **Early commitment - user & industry.**

Theory and Practice - Naval PPO Perspective

- **First 3 Domains - PPO**

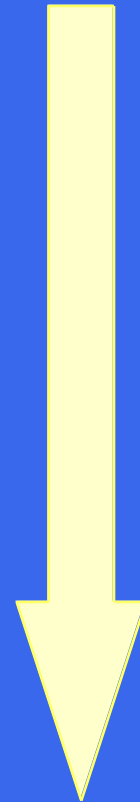
Top 3 Domains

- **Manpower**
 - Numbers, Skills, Organisation
 - Career Management, Conditions of Service
 - Branch Development
 - Long term planning
 - Budget - Life Cycle Cost.
- **Personnel**
 - Can it be done & sustained?
- **Training**
 - Correct Manpower and Personnel prerequisite.

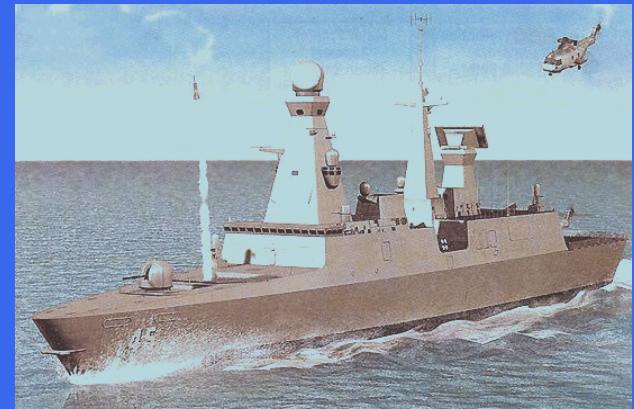
Theory and Practice - PPO Perspective

- **First 3 Domains - PPO**
- **Ambitious Equipment acquisition programme**

NOW



2015 +



Theory and Practice - PPO Perspective

- First 3 Domains - PPO
- Ambitious Equipment acquisition programme
- **NMA AIM**

Aim of the NMA

**The aim of the NMA is to ensure
that sufficient manpower is available
on the trained strength and deployed
effectively in Peace, Crisis,
Transition to War or War**

Theory and Practice - PPO Perspective

- First 3 Domains - PPO
- Ambitious Equipment acquisition programme
- NMA AIM
- **Strategic Manpower Review**

SMR Scoping

- Aiming point 2015
- Concept paper to Navy Board Dec 00
- Defence Doctrine - Tasks, Hardware
- Deployment, Skills, Numbers, Training
- Employment
- Functions essential to running Navy
- Consider other Activities

Difficult Aspects

- **Role and Authority of PPO in AMS**
- **System Boundary**
- **Requirement Definition**
- **“Relevant” TAD**
- **Data Hungry Modelling - Information Famine**
- **Approach differs between projects/arms**
- **Organisational “inertia”**
- **Cost v. Cost Benefit**
- **Confidence - how do we know it's right?**

Summary

- **Policy and Intentions**
- **Mechanisms to apply HFI**
- **Reality of Application**
- **Is it working?**
- **Physician heal thyself ?**

ACNS Comment

“.....a committed approach to human centred design and the thorough application of human factors integration (HFI) are essential to the development process. If not, the wider utility and flexibility required of the [*future ship*] may not be fully realised and may preclude efficient adaptation to future requirements. A statement on the strategy for incorporation of HFI as part of risk reduction is needed”

